



UNITED STATES PATENT AND TRADEMARK OFFICE

81
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,799	10/03/2003	Tobias Gerlach	KOA 0242 PUS (R 1415)	3893
22045	7590	07/01/2004		
BROOKS KUSHMAN P.C. 1000 TOWN CENTER TWENTY-SECOND FLOOR SOUTHFIELD, MI 48075			EXAMINER WEST, JEFFREY R	
			ART UNIT 2857	PAPER NUMBER

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/678,799

Applicant(s)

GERLACH, TOBIAS

Examiner

Jeffrey R. West

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Applicant has indicated that the instant application claims "the benefit under Title 35, United States Code, 120 of any United States application(s) listed below," listed as PCT/EP02/05877. Since this application is not a United States Application, the priority claim under 35 USC 120 is not considered valid. Further, PCT/EP02/05877 was published on December 05, 2002, before the filing of the instant application.
2. Acknowledgment is made of applicant's claim for priority under 35 U.S.C. 119(a)-(d) based upon an application filed in Germany on May 30, 2001. A claim for priority under 35 U.S.C. 119(a)-(d) cannot be based on said application, since the United States application was filed more than twelve months thereafter.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. Claims 1-6 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0122515 to Lutter et al. in view of U.S. Patent No. 4,583,190 to Salb.

Lutter discloses a method for determining the frequency of current ripples contained in the analog armature current signal of a commutated direct current motor (0015, lines 1-16) comprising determining an armature current signal (0021, lines 1-2), determining an electric operating parameter of the motor (0021, lines 1-2), determining a result of the current ripples contained in the armature current signal based on differences between the armature current signal and the motor electric operating parameter (0021, lines 3-8), and determining current ripple frequency from the current ripples contained in the armature current signal (0022, lines 12-16) during a start-up phase of the motor (0015, lines 11-12).

Lutter discloses that the motor electric operating parameter is an armature voltage signal (0021, lines 1-2).

Lutter discloses determining a relationship between the rotational speed of a drive shaft of the motor and the current ripple frequency (0010, lines 1-3) and determining a rotational position of the drive shaft based on the rotational speed (0021, lines 4-6 and 0022, lines 12-16).

Lutter discloses monitoring the current ripple frequency for changes during the operation of the motor (0015, lines 1-16) by counting the current ripples contained in the armature current signal and modifying the number of counted ripples as a function of a changes in the current ripple frequency (0002, lines 8-19 and 0022, lines 6-16).

Further, in addition to determining a current ripple frequency based on differences between an armature current signal and an armature voltage signal,

Lutter also discloses that the current ripple frequency is also based on differences between an armature current signal, an armature voltage signal, and another armature current signal at a different motor operating state (0008, lines 12-14 and 0020, line 1 to 0022, line 6) and therefore the resulting current ripple frequency result is based on differences between all of the armature current signal, the armature voltage signal, and the armature current signal at a different motor operating state.

As noted above, the invention of Lutter teaches many of the features of the claimed invention including determining both armature current and voltage signals to determine the frequency of current ripples in the armature current signal. Lutter does not, however, specifically determine a frequency spectral result of these current and voltage signals through digitization and a Fast Fourier transform.

Salb teaches a microcomputer-based system for performing Fast Fourier Transforms wherein the analog signals being analyzed are first digitized at each point in time and then analyzed using a fast Fourier transform to obtain an unfiltered frequency spectral result (column 7, lines 46-48).

It would have been obvious to one having ordinary skill in the art to modify the invention of Lutter to include determining a frequency spectral result of these current and voltage signals through digitization and a fast Fourier transform, as taught by Salb, because this method for frequency analysis is well-known in the art to provide the user with easier mathematical analysis and, as suggested by Salb, would have

provided more accurate analysis due to the signals being better defined in classical mathematical signal processing terms (column 7, lines 28-34).

Further, Lutter does disclose digitizing the armature current signal at another operating state through a digitizer which is then input to a comparator, wherein the comparator receives as a second input the first armature current and voltage signals. Therefore, although not specifically disclosed, Lutter suggests the desirability of digitizing the first armature current and voltage signals because such an operation would be necessary for proper comparison in the comparator.

5. Claims 7, 9, 10, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lutter in view of Salb and further in view of U.S. Patent No. 6,459,223 to Mauel et al.

As noted above, the invention of Lutter and Salb teaches many of the features of the current invention including determining a position of the motor based upon a the current ripple frequency and the speed of the motor as well as determining a relationship between the rotational speed of a drive shaft of the motor and the current ripple frequency, but does not specify determining the speed based upon the current ripple frequency.

Mauel teaches a motor vehicle door lock and process for its control including means for determining and counting the number of current ripples and from this count determining the rotary speed or other parameters (column 3, lines 15-20), such as the angular position (column 27-31).

It would have been obvious to one having ordinary skill in the art to modify the invention of Lutter and Salb to include determining the speed based upon the current ripple frequency, as taught by Mauel, because Mauel suggests that the combination would have provided a functionally equivalent method for determining the motor position information from a current ripple, as is the intent of Lutter and Salb, with high accuracy, reliability, and simple structure (abstract and column 6, lines 6-15) and improve upon the accuracy of the method of Lutter and Salb that ignores seemingly inconsequential environmental factors by taking into account all factors that could skew the results (Lutter 0010).

Response to Arguments

6. Applicant's arguments with respect to claims 1-7 and 9-19 have been considered but are moot in view of the new ground(s) of rejection.

The following argument, however, is also noted.

Applicant argues that "the Examiner's motivation for modifying Roussel with Salb was that frequency analysis provides more accurate analysis due to the signals being better defined in the classical mathematical signal processing terms However, Salb notes that the disadvantage in using frequency analysis includes 'the much more intensive computation necessary as compared to time domain techniques' As such, it may not necessarily be evident to one skilled in the art to sue frequency analysis instead of time analysis in those applications which could be properly used with either analysis."

The Examiner asserts that it has been held that disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. In re Susi, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." In re Gurley, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). Therefore, although Salb does describe disadvantages in the frequency analysis, Salb does include sufficient advantages for one having ordinary skill in the art to make the modification.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U.S. Patent Application Publication No. 2003/0137857 to Yamanaka et al. teaches a method for controlling pwm pulse including current ripple manipulation.

U.S. Patent No. 6,628,893 to Ohno et al. teaches a DC motor rotation control apparatus including determination of a current ripple that corresponds to the rotation angle position of a rotor.

U.S. Patent No. 6,456,028 to Aoki et al. teaches a pulse generating circuit for driving a DC motor which is capable of pulse generation following the variation of the motor rotation condition and of stable ripple pulse generation.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)272-2216. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2857

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jrw
June 21, 2004


MARC S. HOFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800